

TELEPHONE NUMBER AREA CODE PROCESSOR**PRIORITY**

[0001] This application claims priority to U.S. application Ser. No. 10/024,033, filed Dec. 21, 2001, which is a continuation of U.S. application Ser. No. 09/291,213, filed Apr. 14, 1999, which issued on Feb. 5, 2002 as U.S. Pat. No. 6,345,095B1, and which claims priority to provisional U.S. patent application No. 60/081,735, filed Apr. 14, 1998. The specification of U.S. application Ser. No. 10/024,033 and of U.S. application Ser. No. 09/291,213 are incorporated herein by reference.

BACKGROUND OF THE INVENTION

[0002] This invention relates to the selection of telephone numbers, and more particularly to devices and methods for assisting telephone subscribers in connecting to the desired destination when the area code or service code is unknown or has changed.

DESCRIPTION OF THE RELEVANT ART

[0003] In North America, the telecommunications numbering plan generally divides the country into geographical area code service areas. Each three-digit area code is divided into three-digit central office exchanges that generally cover geographical sub-areas of the area code service area. In the early days of telephony, the geographical sub-area served by a particular exchange would not generally overlap the geographical sub-area served by another exchange. Further, the geographical sub-areas of area codes were often established with sensitivity to existing political boundaries so that residents of a particular community, for example, shared the same area code.

[0004] Unfortunately, the number of subscribers that can be served by a particular exchange is limited by the number of digits that can uniquely identify a subscriber line within the exchange. The use of four-digit subscriber numbers limits the number of subscribers within an exchange to 10,000 telephone numbers. As particular geographical sub-areas develop, however, they may eventually require more than 10,000 subscriber numbers. This problem is typically resolved by defining new exchanges whose geographical sub-areas may overlap the geographical sub-areas of existing exchanges. However, with the exception of wireless exchanges, the geographical sub-area covered by a particular exchange is generally completely confined to a particular area code service area. This restriction ensures that duplicate three-digit central office exchange codes may be freely assigned in adjoining area code service areas.

[0005] The use of identical exchange codes in adjoining area code service areas, however, may create ambiguities when subscribers dial numbers outside of their local exchange. These ambiguities are resolved by requiring subscribers to include area codes when dialing such numbers. In earlier days, central office exchanges were known by mnemonics and most subscribers making local calls were only required to memorize a four or five digit number and an appropriate mnemonic (e.g., POplar 55399). Now, however, subscribers may be frequently required to enter a three-digit area code, a three-digit exchange code, and a four digit subscriber number plus other access numbers that may be required.

[0006] The recent rapid increases in the number of fax machines and cellular/mobile phones has only increased the rapid utilization of available phone numbers. As with subscriber numbers, exchange codes have also been completely utilized in some area codes in the U.S. This has made it necessary to add additional area codes in densely populated areas by splitting the existing area code domain into two or more separate area codes. Whereas only a few years ago (circa 1990), an area code might apply to an entire state in the United States, the ensuing proliferation of area codes has reached the point where four different area codes might lie within a radius of several miles. Further, the advent of area code overlay has led to a situation where multiple area codes can coexist at a single point, requiring 10-digit dialing even for local calls. The result is confusion and complexity for the telephone user. Calls placed without the appropriate or new three-digit, destination area code currently result frequently in either an undesired connection, a phone company message about an area code change, or a recorded message that the number is simply not in service. In any of these events, the user is forced to redial the call using the revised "full" telephone number, provided that the caller can easily find that revised number. The full telephone number includes all digits, including area code and other prefix digits such as "0" or "1", that may be needed to reach the desired destination in the desired manner.

[0007] A number of aids have been developed to help subscribers formulate correct telephone numbers. Auto-dialers, for example, are well-known devices that enable subscribers to generate complete telephone numbers based on pre-programmed hot-keys or special code sequences; however, autodialers assume that the caller already knows the currently correct phone number. Autodialer data that has not been updated to reflect the latest area code changes will also yield the same frustrating results mentioned previously. A more sophisticated area code aid is described in U.S. Pat. No. 5,859,901, entitled "Intelligent Call Connection Service" and issued Jan. 12, 1999, to Brendzel et al. The Brendzel system operates on dialed sequences that do not contain area codes, and attempts to provide an appropriate area code by analyzing the called party number relative to the calling party. The analysis performed by the Brendzel system includes consideration of the calling pattern of the calling subscriber, and the distance between the calling party and the called party.

[0008] Despite the conveniences provided by auto-dialers and devices such as that described in the Brendzel patent, there remains a need for subscriber aids that will permit the subscriber to choose conveniently and efficiently the most appropriate area code by providing the subscriber with an analysis of any telephone number. The subscriber, for example, may desire to call a telephone number in a remote city (herein, "telephone number" refers to the exchange code and the subscriber number combination without area code) and may know an area code for that region, state or city. If the subscriber were presented with a list of valid area codes, within some proximity to the remote city, for the telephone number, then the subscriber could select the telephone number and area code combination that seemed most likely to be correct.